

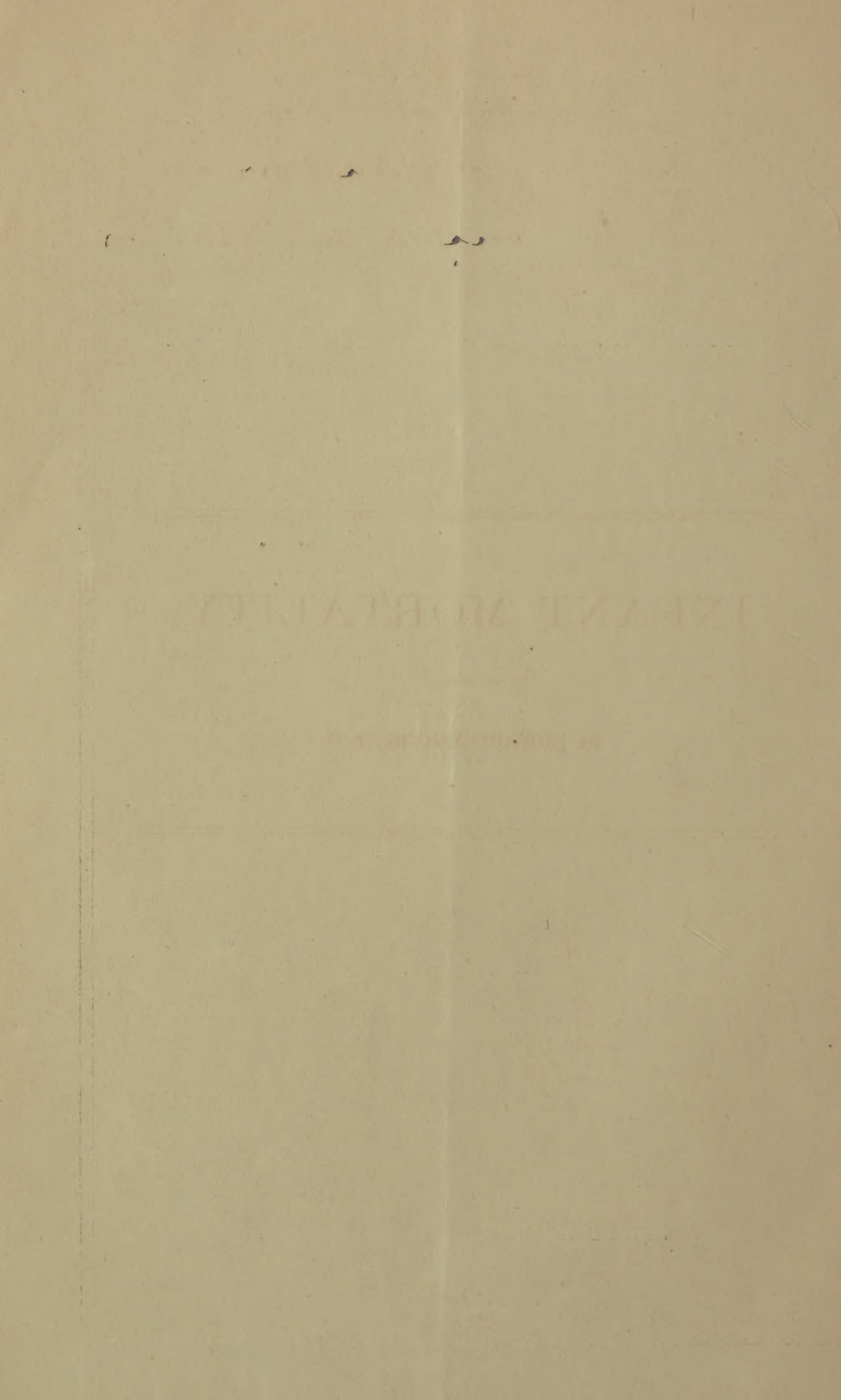
Jarvis (Ed)

INFANT MORTALITY.

By EDWARD JARVIS, M. D.

[FROM THE FOURTH ANNUAL REPORT OF THE MASSACHUSETTS
STATE BOARD OF HEALTH.]

BOSTON:
WRIGHT & POTTER, STATE PRINTERS,
19 PROVINCE STREET.
, 1873.

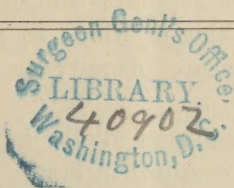


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Presented by
the Author

INFANT MORTALITY.

The perfect child comes to the world with all its organs in complete condition,—the stomach to digest its food, the heart to circulate the blood, the lungs to purify it, the nutrient arteries to convert it into flesh, the skin for protection, the bones and muscles for motion, and the brain to preside over all.

“Death in childhood is an unnatural event, inasmuch as the regular series of development of the human structure, from the germ-cell to the perfect man in his prime and in his last declining stage of existence, is interrupted.”

“But life, at all ages, depends upon so many conditions, and is exposed to so many risks, that out of given numbers of living some die at every age, and we can only take for a practical standard the lowest authenticated rates of mortality.”*

This is the physiological view of the early condition of man.

There is no gift to humanity so great, so valuable, none that offers so rich a source of happiness and comfort, as a child to a parent. There is nothing of which so much may be made. There is no such treasure offered; no such responsibility placed upon a family.

The child is the promise of all the hereafter. The whole future of the world is wrapped in him. Unless he fulfil this promise and grow to manhood, the family ceases, the state perishes, the human race comes to an end. The family have the intensest interest of affection in his preservation, and all the pride and power of the nation rests upon his life.

But as soon as the child appears among us, with all the promise of life, it is beset with manifold perils, that assail its vitality and tend to destroy it. These influences of evil appear on every side, to which it has but little power of resistance. Although perfectly organized and endowed with all the means of carrying on the processes of life, the child is fragile, it has a small amount of vital force and requires

* Reg. Gen. England, Supplement to 25th Rep. p. ix.

favorable conditions and incessant care to protect it from the dangers that may threaten it.

Death then begins at once to assail these hopes of man, and in the first week, the first month, the first year, and onward, children perish in large numbers.

Beaugrand says :—

“For a long time hygeists have been occupied with the enormous mortality of infants in their first year. A great number of works have been published on this important question. Statisticians have been called to aid in the explanation of the complex condition of this social problem.”

Everywhere in the world, and in all ages from the beginning, there is and has been the great cry of disappointment and sorrow at this great loss. There is and has been a great diversity in the mortality of children in various places. These differences are connected with varying conditions and circumstances. The seasons, local and endemic influences, and more than all, the means and manners of life in the family seem to be prominent as friends or foes, to aid or impair the infant constitution, in its struggle against the adverse influences that threaten it.

To the wise and the faithful are accorded the best results of their endeavors, to save their infants from destruction. But no community is free from this danger or loss. The records of all nations show a large proportion of the children that perish, on the way, from birth to maturity.

Massachusetts is one of the most favored States in the world for the intelligence, at least of its native population, and for their thrift and wisdom in management. In this Commonwealth, during the fifteen years ending 1870, there were 514,233 children born; and 71,526, or 13.91 per cent. of these died in their first year, and 131,784, or 25.52 per cent. before they had completed their fifth year. This includes the record of the foreigners, whose infant mortality was in a larger ratio, as well as that of the native families whose infant mortality was at a lower rate, than this average.

The following table shows the experience of most civilized nations in this respect :—

Showing the Births and Deaths under one and under five, and the ratio of each to Births.

COUNTRY.	Period.	Births.	DEATHS.		RATIO OF DEATHS TO BIRTHS.	
			Under One.	Under Five.	Under One.	Under Five.
Massachusetts, ¹	1856-1870, . .	514,233	71,526	131,784	13.91	25.62
Michigan, ¹	1868-1870, . .	78,786	-	11,072	-	14.05
England, ¹	1851-1860, . .	6,471,650	996,630	1,706,583	15.40	26.37
Scotland, ¹	1855-1868, . .	1,331,250	180,363	353,906	13.55	26.58
Sweden, ²	1856-1860, . .	404,829	90,135	159,993	14.34	25.46
Norway, ³	1856-1868, . .	677,967	72,651	127,635	10.71	18.82
Prussia, ⁴	1852-54, . .	2,292,150	411,398	678,875	17.94	29.61
Austria, ⁵	1860-61-65, . .	3,076,811	775,082	1,175,598	25.19	38.19
Bavaria, ⁶	1857-62, . .	823,468	280,353	335,687	34.04	40.64
Netherlands, ⁷	1850-59, . .	1,075,979	260,112	379,153	24.17	35.24
France, ⁸	1857-62, . .	5,739,275	964,434	1,560,480	16.80	27.18
Italy, ⁹	1868, . .	900,416	204,300	366,200	23.80	40.67
Spain, ¹⁰	1858-62-65-68, . .	5,334,958	993,115	2,052,212	18.61	38.16

¹ Annual Reports.² Officiela Statistik Helsing och Sjukvarden.³ Officiela Statistik.⁴ Preussische Statistische, 1862-3-4-9.⁵ Statistische Jahrbuch, Oesterliche.⁶ Statistik der König-Bayern.⁷ Statistisch Jaarboek, Nederland.⁸ Mouvement de la Population.⁹ Statistica de Regno d'Italia, 1868.¹⁰ Anuario Estadístico de España 1866-67.

Another method of comparison is the proportion of deaths to the living at the same age. This is stated in the English and Scotch reports, and may be calculated for others.

A less reliable ground of comparison, but none the less certain as evidence of early mortality, is the proportion of deaths that fall on any age to the total number of all ages.

The following table shows the proportion of the total deaths that fell on those under one and under five years :—

COUNTRY.	RATIO PER CENT. OF ALL AGES.		COUNTRY.	RATIO PER CENT. OF ALL AGES.	
	Under 1	Under 5		Under 1	Under 5
Massachusetts, ¹	19.43	36.61	Norway, ⁴	18.82	33.33
Kentucky, ¹	21.87	41.61	Prussia, ⁵	21.25	47.52
So. Carolina, ¹	23.31	45.59	Austria, ⁶	30.39	49.96
Michigan, ¹	25.93	33.21	Holland, ⁷	31.94	46.58
England, ¹	21.24	40.53	France, ⁸	20.92	32.71
Scotland, ¹	19.35	37.96	Italy, ⁹	27.72	47.26
Russia, ²	—	52.60	Spain, ¹⁰	18.61	38.46
Sweden, ³	22.26	39.52			

¹ Annual Reports.

² Government Report.

³ Officiela Statist. Helso.

⁴ Officiela Statist.

⁵ Preussische Statist.

⁶ Statist. Jahrbuch.

⁷ Statist. Jaarboek.

⁸ Mouvement de la Population.

⁹ Statistica del Regno.

¹⁰ Anuario Estadístico de Espana 1866 67.

Here are manifestly very different proportions. This difference may be, in part, due to the difference of the composition of the living population.

In a State just settled by immigrants a very large proportion of the people are youths and middle-aged, and comparatively few children, and still fewer infants and old people, and of course, in their mortality, there would be a correspondingly large proportion in middle life, and small in infancy and old age. Soon they marry, and in a few years the young children and infants form a large and the aged a small proportion of the population. Consequently the reports of deaths in the same period, show a large proportion of infants, a smaller proportion of the middle-aged, and very small of the very old. Nevertheless, in old and fixed populations, these differences indicate something more than the difference of the proportions of the living.

Whatever may be the explanation of the difference of the proportion of infants to total mortality, still the irresistible fact remains that from nearly one-fifth to nearly a third of all the deaths fall upon infants under one; and from a third to a half upon children under five; and the still more decided and indicative fact that from a seventh to one-fourth of all that are born, fail to pass their first year, and twenty-five to forty per cent. perish before they have completed their fifth year.

REASONS.

The first question that arises is, whether it is a necessary condition of human life that so many should perish in the outset. Are these proportions of children endowed originally with such feeble constitutions, that they cannot endure the burden of earthly life beyond the period of one or five years? Are they endowed with only sufficient living force to run the vital machine for these brief periods?

There is no doubt that with many it is so, that some children are born with low and imperfect organizations, and with constitutions too weak to sustain the process of development, and therefore more or less must fall by the way. This explains a part of this great proportion of infant mortality.

PREMATURE BIRTH.

The security of infant as well as of adult life, depends primarily on its constitutional force, or power of performing its organic functions with vigor and comfort, even amidst the causes of disturbance and disease.

The primordial constitution depends on prenatal conditions which belong to or may be controlled by the parent. Life proceeds from life, like forms like. The parents can give only such as they have in themselves. The feeble, the scrofulous, the intemperate, those who are themselves vitiated or impaired by heritage, by disease and exhaustion, or by sensual indulgence, have no fulness of power to impart to their children. The parents who in any way waste or vitiate their own vital force, or unwittingly suffer it to be vitiated or reduced, do or suffer this for their offspring that afterward proceed from them. Their constitution, whatever it may be, is an entailed estate that must pass, with all its worth and incumbrances, to the

heirs of their own bodies. The misfortunes and sufferings as well as the iniquities of the fathers and mothers are visited upon their children, possibly, even to the third and fourth generation.

The conception and the prenatal being of the child are thus entrusted to the parent, and it requires for its full development and preparation for outward life and exposure, all the mother's care and devotion. If she fail to regard her new condition, and recognize her new responsibility, and adapt her habits of action, costume and diet to the wants of the prospective child; if she, from influence of fashion, desire of concealment or other motive, refuse to allow the child opportunity of expansion, or if she expend her forces in excessive labor or exposure, or dissipation of gay or vulgar society, or if she suffer from privations of proper food, or indulge in unsuitable diet, and thus impair her digestion, or embarrass her nutrition, she diminishes her power of giving her child the full development that can only be secured by a healthy and well ordered life in the parent.

All these conditions and habits as they occur in the parent, have their natural effect on the constitution of the child, and diminish its power to bear the exposure of the world, and to resist the causes of disease.

The first and immediate danger from any irregularity of the mother is premature birth, which sends the child abroad before it has completed the prenatal development that nature intends for her perfect children. Those who are thus born before their time are generally, almost universally, feeble, and imperfectly prepared for outward life.

In England, during the six years, 1858 to 1863, inclusive, among 626,340 children that died in their first year, 45,814 were prematurely born,* and had incomplete development, and therefore, were imperfectly prepared for the contact with the outward world. These constituted 7.31 per cent. of all the deaths of children, under one year old. In the ten years, 1861 to 1870, the deaths of 85,118 children, or 1.75 per cent. of the whole, are ascribed to this cause alone.†

* Supplement to the Reg.-Gen. 25th Report p. vi.

† Reg.-Gen. 24th to 33d Reports.

There is no record to show how many of the children were prematurely born in this period, but it is not to be supposed that they made any approach to the proportion. The premature children have a much harder struggle to live, than those that are born at full time, and a much larger proportion succumb before the trials that they encounter.

"At the Maternity Hospital in Paris, in 1869, there were 1,320 births at full time and 641 premature, 1,961 in all. 127 or 9.5 per cent. of these born at full time, and 332, or 51.8 per cent. of those prematurely born, died early. The proportion of mortality in the last was almost six times as great as in the class more completely developed and prepared for the chances and exposures of life." *

DIFFERENCE OF CONSTITUTIONAL FORCE.

In the question of mortality or liability to death, there is ever to be held in mind, both the power of the disease or the destructive agent, and the constitutional power of resistance.

A child inheriting a weak constitution or prematurely born, with constitution incompletely developed, or with constitutional force reduced by imperfect nutrition, exposure to cold or extreme heat, or by neglect, must yield before a smaller force of morbid agency than one born at full time, with constitutional powers completely developed and sustained by proper and successful care.

HEALTHY DISTRICTS.

Philosophical vital statisticians make several classes of districts, divided according to their sanitary conditions and vital results. Those that have the lowest rate of mortality, show at least the natural liability or capability of living, belonging to the human constitution in the best condition and under the most favorable circumstances. In table, on page 196, the lowest rates of mortality, as compared with the births, were 10.71 per cent. in the first year, and 18.82 per cent. under five, in Norway.

In Massachusetts, the mortality, under one, was 13.91 per cent., and under five, 25.62 per cent.

In Sweden, these proportions were severally 14.34 and 25.46 per cent.

* Beaugrand, *Ann. Hyg.* xxiv, 2d series.

They were 15.40 and 26.37 per cent. in England, and in Prussia 17.94 and 29.61 per cent.

On the other extreme, the deaths were 25.19 per cent. under one and 38.19 per cent. under five in Austria, including Hungary. They were 24.17 and 35.24 per cent. in Holland, and 23.80 and 40.67 per cent. in Italy, and the highest rates were 34.04 and 40.64 per cent. in Bavaria.

Thus we see, that the infant mortality was more than twice as great in Italy and Holland, two and a half times as great in Austria, and almost three and a half times as great in Bavaria, as it was in Norway; and the proportion of deaths of children, under five, was twice as large in Spain, Italy, Austria and Bavaria as it was in that colder but more healthy country of the Norwegians.

Thus, as often as 1,000 infants died in Norway, 1,298 died in Massachusetts, 1,338 in Sweden, 1,438 in England, 1,738 in Spain, 2,222 in Italy, 2,257 in Holland, 2,352 in Austria, 3,178 in Bavaria, among the same numbers born in each country.

It is not to be supposed that it is the primary intention of nature that the little children should perish so much more frequently in Bavaria, than in Norway or Massachusetts. The Norwegian rates of mortality, 10.71 per cent. under one, and 18.82 per cent. under five, are the lowest for infants and children that are found in the record of any nation. This, however, includes the whole country of Norway,—all its districts, healthy and unhealthy, all its people, discreet and indiscreet, favorably and unfavorably situated.

If a selection of districts, and people, and families could be made, and the experience of only the best included, there would be found a much lower rate of early death than these figures present for the whole nation.

Yet taking these rates of 10.71 per cent. under one and 18.82 per cent. under five, and admitting that so much is unavoidable, certainly in any large community it is worth while to inquire whether the excess that is found elsewhere, or even a part of that in Norway, may not be due to causes that are, in greater or less degree, subject to human control, and whether if guided by the best intelligence and under the

best moral discipline in those that have the care of infancy and childhood, the death-rate in these periods may not be reduced everywhere to the Norwegian standard.

From their exceedingly delicate sensibility, infants are susceptible of injury from manifold causes, either in the omission of what is necessary in appropriate food, in pure air, in temperature, in protection from cold, in the many attentions that tender and judicious nursing may give to develop the constitution or to sustain it during the progress of growth.

These morbid influences are found in various degrees and proportion in all countries and among all people. No one stands alone anywhere, but each may have a prominence and do most of the deadly work on those feeble lives.

CARE OF INFANCY.

The most difficult task undertaken by man is the creation and development of life. Gardeners watch their tender germinating seeds and shooting plants with unfailing attention. They regulate all the influences that can bear upon them. They provide in due measure appropriate soil, nutriment, moisture, air and warmth, knowing that from any neglect of these matters the health of the feeble plant must suffer, and life may fail.

Farmers watch the young of their animals with assiduous solicitude; they inquire into every circumstance and determine its probable effect on the new life; they give the tender beings every favorable influence, and defend them from all that may harm them,—cold, rain, and improper food.

No other form of life, whether in the animal or plant, is so tender and so susceptible of injury as that of a child; it is the most delicate of all creatures, and demands the most exact obedience to the conditions of its being and the appropriate supply of its wants. It bears no neglect without suffering, no injudicious interference without injury.

DEATHS IN EARLY WEEKS AND MONTHS.

This extreme tenderness is in the inverse ratio of the age of the child. The largest ratio of death is in the first week

and the first month. It gradually diminishes from the beginning of the child's days.

In France, the record shows that of 1,000,000 children born,—

29,123	die in the first week.
22,128	“ “ second week.
22,236	“ “ sixteen following days.

73,487 die in the first month.*

In England, according to the Life-Table, of 1,000,000 that are born,—†

46,503	die in the first month.
17,195	“ “ second “
12,178	“ “ third “
10,100	“ “ fourth “
9,550	“ “ fifth “
9,033	“ “ sixth “
8,547	“ “ seventh “
8,087	“ “ eighth “
7,657	“ “ ninth “
7,253	“ “ tenth “
6,872	“ “ eleventh “
6,518	“ “ twelfth “

149,493 die in the first year.

From these it appears that in France, one in 34 died in the first week, one in 44 in the second, and the same proportion in the next sixteen days, and one in 14 the first month.

In England, one in 21 died in the first month, one in 56 in the second, one in 77 in the third, and one in 131 in the twelfth.

With its exceedingly delicate susceptibilities, the infant demands every favorable condition of care, clothing, warmth,

* Reg. General England, Sup. to 25th Rep. p. vii., calculated from the French Reports.

† English Life-Table, p. xxiii.

air, food and circumstances. It wilts under every privation of any of these means of life, and sinks under any adverse influence, from whatever cause.

DISEASES OF INFANCY AND CHILDHOOD.

The diseases that destroy life in infancy and childhood are found in all countries and climates, yet in very different proportions. The following tables show the ratios of deaths from each cause or class of causes, of children in the United States, Massachusetts and England :—

Showing the Proportion of Deaths from each Cause, or Class of Causes, to all Deaths under five, in the United States and Massachusetts.

CAUSES.	MASSACHUSETTS.*	UNITED STATES.†
	Both Sexes— 1870.	Males— 1859 - 60.
ALL CAUSES,	10,000	—
Disease of Brain,	138	214
Bronchitis,	102	70
Cephalitis,	355	474
Cholera Infantum,	1,740	327
Consumption,	323	255
Convulsions,	480	523
Croup,	414	942
Debility,	195	52
Diarrhœa,	257	412
Diphtheria,	157	52
Dysentery,	288	489
Enteritis,	94	202
Typhus Fever,	134	164
Hydrocephalus,	457	207
Canker,	133	—
Measles,	203	184
Infantile,	476	427
Pneumonia,	685	739
Premature Births,	252	—
Scarlet Fever,	714	1,075
Tabes Mesenterica,	274	44
Teething,	292	322
Whooping-cough,	327	447
Burns,	55	—
Casualty,	25	450
Lung Diseases,	29	113
Scrofula,	55	83

* Annual Report.

† Census, 1860. Mortality Vol.

*Showing the Proportion of Deaths from each Cause, or Class of Causes, under one year in England.**

CAUSES.	Males.	Females.
ALL CAUSES,	1,000,000	1,000,000
Disease of Brain,	223,209	208,015
Disease of Lungs,	146,561	137,218
Cholera, Diarrhoea, Dysentery,	90,218	93,619
Other zymotic diseases,	39,431	43,118
Whooping-cough,	33,174	45,068
Hydrocephalus,	27,794	24,587
Disease Stomach and Liver,	23,490	19,810
Scrofula, Tabes Mesenterica,	23,373	23,865
Measles,	13,669	14,446
Phthisis,	12,548	13,975
Scarlet Fever,	11,252	11,299
Violence,	10,488	12,109
Small-pox,	9,773	11,201
Typhus Fever,	5,762	6,010
Heart Disease and Dropsy,	4,151	4,481
Disease of Skin,	2,829	3,225
Diphtheria,	1,931	1,798
Disease of Kidneys,	376	272
Disease of Joints,	316	446
Cancer,	154	209
Disease of Generative Organs,	79	59
Other Causes,	318,768	324,905

Thus it is seen that diseases of the digestive organs caused more than one-quarter of the deaths, under five, in Massachusetts, and about one-ninth, in England. Diseases of the brain and nervous system, including dropsy and convulsions, destroyed about one-seventh in Massachusetts, and one-fourth in England. Disturbances connected with the lungs and respiratory organs, including croup and whooping-cough, caused nearly one-fifth of the deaths of children in both countries.

These are the leading causes of death in infancy and childhood, in all nations, but differing in their proportions.

Both in Massachusetts and in England the reports include a considerable number of deaths, mostly in infancy, under the causes termed "Debility," "Atrophy and Debility," "Inanition," "Premature Birth," all resting upon imperfections of

* Calculated from Table in Supplement to Reg. Gen., 25th Rep., p. 2.

constitutional development or force, and inability to digest food and obtain from it sufficient nutriment for the body.

FOOD AND NUTRITION.

The prominent wants of the infant are food, warmth and air.

The first is provided by nature in the mother's milk, which is exactly adapted to the feeble and tender digestive organs of the child, and changes in its character with the necessities and capacities of the new-born consumer.

No other aliment can take the place of the human milk. The milk of other animals,—cows, goats, etc., are not so well adapted to the powers and wants of infants. Their stomachs find great difficulty in digesting it, and their assimilative organs often are unable to extract from it sufficient aliment to supply the wants of the textures.

The nurse-bottle, which is used, too frequently for the child's good, from seeming or actual necessity, is filled sometimes with contents less acceptable and more injurious to the infant's stomach—gruel, chicken-broth, pap of manifold kinds. Beaugrand, in his article on the early death of the new-born, calls the nurse-bottle deadly, "*funeste*," and shows how the children that are fed by it sometimes die from inanition, as it is termed, from want of power to convert the food into flesh. Whether the child has nothing to eat, or has its stomach filled with food which it cannot digest, or of which the nutrient arteries cannot make flesh, it is all the same to the child; it is actually starved for want of nourishment in the textures, the place where it is needed.

MOTHER'S TEMPORARY ABSENCE.

The infant not only needs the mother's milk, but wants it frequently. The fountain should never be long absent.

The nursing children of those mothers whose labor or business or pleasure require their protracted absence from home, suffer much from hunger and defective nutrition. Some pine away, and some at length sink into death. Among the poor there are some who are called from their homes, to work abroad during the day. They are with their babies and can nurse them only in the morning, before they go to their

work abroad, at noon when they return to their own dinner, and at night after their day's labor is finished. And some even are absent through the whole day. The infants are thus left to be fed at home by cow's milk, goat's milk, farinaceous food and other unnatural and unsuitable means.

This is common in England, where women work on the farms, often distant from their homes, and in the factories. Dr. Husband says :—

“In some of the agricultural districts of England we find a very high rate of infant mortality. The medical officers of health, after investigating the subject, found that the cause of the excess was the employment of female labor. The mothers are employed at out-of-door work, and their children are left in the hands of bad nurses, or children not much better.

“It is found that in certain families, child after child is born, which as regularly dies, and the neighbors know as well as may be, that the child terminates its existence, not through accidental death, but from carelessness and deprivation of food.”*

Beaugrand says, that in the neighborhood of great manufacturing establishments, in France, the children of the female operatives perish in their early weeks or months of life from this cause. The mothers in their straitened circumstances, feel obliged to contribute as much as possible to the support of their families, by working in the mill. So they get back to the factory as soon as possible, after their confinement; consequently, the sickness and mortality of the infants of these mothers are increased. This was manifested in many industrial centres. In Manchester, England, the death-rate of these children of the operatives rose to 22 to 23 per cent., and in Mulhouse, a large manufacturing town of France, it rose as high as 30 even 38 per cent. This attracted the attention of Mr. Dolfus, the wealthy proprietor of one of the establishments, whose wisdom and success were only equalled by his thoughtful benevolence. He then ordered that every one of his female operatives, who should be confined, should remain at home and attend to her child, for six weeks, after it was born; but that her wages should be paid the same as if she were at work. This was the first of November, 1862. There were then 1,050 women employed in his factory; one hundred and eight of these were confined

within the next year, and twenty-five of the children died. This was but two-thirds of the proportion of the previous year's mortality. In the next year, the mortality was still farther reduced.

Mr. Dolfus was so well satisfied with the result of his humane plan, that he proposed to other manufacturers, who employed married women, to adopt it as a permanent rule for their establishments.

Dr. Beaugrand adds, in his admirable article, in the *Annales de l'Hygiene*, 1866—"We proclaim these facts abroad, in trust that all establishments may follow the example of these manufacturers of Mulhouse, who have already ameliorated so greatly the condition of their working-women."

To meet this difficulty, establishments called *creches* have been opened in Paris, London, Manchester and other places, where mothers can deposit their little children, while they are at work away from their homes during the day. Here doubtless these infants are taken care of, as well as possible, in the circumstances. But they are deprived of their natural food, and have a lower chance of health and life, than if they were not separated from their mothers. Dr. Husband adds, "This is after all a very poor substitute for the care and attention of the mother, and a very inadequate provision for the comfort of the child, but no doubt it saves many an infant life." *

The necessities of infant nutrition are the same in all ranks of life, and the child suffers from the want of sufficient and appropriate food, at short intervals, in its early and feeble being. Whenever the mother is kept away, from whatever cause, whether by the necessities of earning bread for herself and her other children, or by the calls of society, or the simple power of ignorance or indifference, the child hungers and is weakened, and sometimes takes the steps that lead to death. The necessity of appropriate nutrition with the mother's milk, and at due times, admits of no relaxation, and cannot bear neglect without injury to the child, through the early months, even to a year or more.

The English and Irish reports include a considerable

number that died for "want of breast-milk." Dr. Husband says this privation leads to debility, inanition, difficult teething and general impairment of health, and consequent inability to resist attacks of disease. And many a child, that was robust as long as it had the natural food, withered away when it was put upon an artificial diet, and finally sank under a mild attack of diarrhœa.

The French statistics show that in one part of France "when children are given to wet-nurses and have the human milk, though not the mother's, the mortality is 37.1 per cent. But in the class of children that are brought up by hand on cow's and goat's milk, or other food, through the nurse-bottle or the spoon, the mortality rises to 63.9 per cent." This difference is noticed in the neighborhood of Paris, to which many of the children are sent from the maternity and foundling hospitals of the city.

EFFECT OF FOOD ON MILK.

It is well known to farmers, especially to those who are milk-producers, that the milk is very materially affected by the food they give to their cows. If they eat onions, the milk has a taste of garlic. Turnips impart a peculiar and unpleasant flavor, and sometimes the cattle eat noxious herbs in the pastures, which are discovered only by the offensive state of the milk.

DISTILLERY-MILK.

A few years ago, there was a great complaint of the milk in New York, which was supplied to the market from cows that were kept at the distilleries and fed upon the waste vegetable matter, the residuum of the process of distillation. The sanitary authorities caused the milk to be chemically examined, and they watched its effect upon the children and adults who drank it. The milk was found to be bad. It was different in elementary character from that produced by cows that were fed upon grass, hay or grain. It was not so well digested in the stomach, nor had it the nutritive power to create flesh and sustain strength. The children lost flesh or failed to gain it. Their skins were pallid, sometimes discolored and corrugated. Their countenances had the appear-

ance of old age, rather than the bright and lively bloom of childhood. They suffered from diarrhœa and dysentery and great debility, and many died.

The French have had this matter under consideration; for they found that although the distillery-fed cows had a great flow of milk and were profitable to the owners, yet the children that drank it suffered a great deal from waste of flesh and strength, and the loss of infant-life was great.

Some years ago, several persons in Malta were poisoned. On investigation, it was found that they had drank the milk of goats that had eaten of the *Euphorbia Helioscopia*, a poisonous plant that grows in the pastures of that island. The characteristic poison was imparted to the milk, and through this it was given to the consumer.

The same relation of diet to milk holds with woman as well as with domestic animals. As the nurse feeds herself, so is the food she offers from her body to the infant that is nourished by her. Those who are meagrely and improperly fed offer meagre and unfitting food to their nurslings. Women who drink beer, porter or spirit for appetite, or with the honest intention to increase the milky secretion, run the risk of providing a vitiated nutriment for their infants.

Even the morbid condition of the mother may be conveyed through her milk to the child. A physician in Massachusetts being called to a nursing-child, suffering from diarrhœa, was informed by the mother that she had the same trouble, and also that she had eaten green corn, which usually had this effect upon her. The physician did nothing for the child, but directed the suspension of this food. The disturbance ceased at once with both. But the mother being very fond of this diet ventured again twice, and at both times the same effect followed in both mother and child, and in both ceased on the suspension of the corn.

Even the medication of the mother is felt also by the child. In July, 1872, there was in Roxbury an infant fatally narcotized through the mother. Suffering from great distress, she consulted her physician, who gave her fifteen grains of chloral hydrate and one-fourth of a grain of sulphate of morphine. In three-quarters of an hour after taking this medicine, she nursed the child, which to all appearance was perfectly well

at the time. But soon afterwards he went to sleep, and manifested the usual effects of narcotism, and died in about twelve hours. Although strict inquiry was made, no cause of poisoning could be discovered except through the milk taken from the mother.*

Purgatives taken by the nurse sometimes act also on the child.

It is manifest that the character of the milk and the health of the child depend very materially on the manner of the mother's self-management, and that much of the ill-health of nursing-children and some of their mortality are connected with the errors in the maternal digestion. Among the poor, who have no choice of food, but must take such as their limited means allow; among the ignorant, who consider, if they think at all, that the stomach is indifferent as to the matters that are put into it, and will digest all alike; among the sensual and self-indulgent, whose appetites or caprices are their ruling motives in selection of food, it is easy to suppose that some will occasionally, more probably very frequently, err in diet. They fail to nourish themselves as they should, and to produce in their own persons the nutriment best suited for the health of their babes. Their children therefore are often badly nourished, they suffer from inanition and debility, and from disorders of the digestive-system, which may end in death.

The deaths from diseases of the digestive organs among children under five in Massachusetts were over 7,900 in the last three reported years, and in England, over 80,000 under one and over 115,000 under five, in the years 1867 to 1870.

These numbers show that the nutritive system is exceedingly susceptible of disturbance, and while it is the absolutely needful agent in the maintenance of life it may become, under improper management, as from other causes, a frequent agent of death.

THE POOR.

The poverty of the poor, as a class, reaches beyond their outward pecuniary condition. They have a small portion of the world's goods, and as a consequence, in a very large pro-

portion of cases, and as a cause of this fact, in many others, they have a lower bodily health and shorter duration of life.

They are compelled to engage in the hardest and most dangerous labors. They suffer more from exposure and from accident. They have less means of sustenance for themselves and their families. Their houses are necessarily cheap, often in the less desirable and healthy places. They live often in wet and unwholesome localities in the country, and in the narrow and crowded streets of cities. They can have but small space around and in the house for themselves. They can have but few rooms, some have but three, others have but two, and many have but a single room for the whole family of father, mother and children. In these, or in this, they do all their domestic work. Here they cook and eat, they wash, dress and sleep, and here they are sick and here they die. Their narrow quarters are filled with the fumes of the cooking processes, sometimes with the smoke of the fire, and often with tobacco-smoke of the self-indulgent father and his visitors. Add to these the emanations from the lungs and the skins of the family, and it is manifest that the air they breathe is corrupted and overloaded, and there is but small opportunity for the dwellers to purify their blood with a good supply of oxygen.

The air of such crowded rooms becomes loaded with an intensely oppressive odor, that attaches itself to the persons and clothing of those who live in them, and is carried abroad through long distances of travel in the open air. There is little opportunity for ventilation, or even motive, for the air abroad, that would first enter their room, is also foul and unhealthy.

The surroundings of these tenements of the poor are often no better than their inward condition; offal is thrown out, filth accumulates, and sends forth its effluvia to poison the air above it.

In the city, their streets are narrow, and the yards of their houses still narrower, and frequently wanting. Their rooms or tenements, both in city and country, are frequently cold. They are sometimes old houses, deserted by the more favored previous occupants, as unfit to be inhabited. Some are new

but badly constructed, and built with as little cost as possible, to accommodate the narrow circumstances of the poor.

Their clothing and other means of personal protection are equally uncertain, and often inadequate for their comfort or their health.

In the market they must consult their finances rather than their digestive powers or their wants of nutrition. They therefore buy the cheaper rather than the most nutritious food, and the cookery is often as imperfect as the material which they prepare.

So all the means that they have of sustaining and of protecting life—the air they breathe, the food they eat, and the shelter and clothing that protect them from the elements are of a lower character than the more favored are able to obtain.

Hence their life and strength are less developed and sustained. They have more sickness and less power to resist its ravages, and they sink earlier beneath its force.

Dr. Marc D'Espine, the celebrated and learned Swiss writer on mortality, says :—

“Wealth and comfortable circumstances increase vitality and longevity. They raise the mean or average of life. They lessen the mortality at all ages, and especially in infancy. But poverty and misery have the contrary effect.” *

The children, especially the infants, with the extreme delicacy of organization and great susceptibility of influence, particularly for evils belonging to their years, feel the force of all these depressing conditions and circumstances more than the adults.

The hard necessities and the severe labors of the mother often prevent her from giving the prenatal child opportunity of development, and after birth she cannot give the little nursling the attention that is needed for the establishment of its physical constitution on the best basis for endurance. Moreover with the ignorance and uncertain discipline of the parents and household, the child is submitted to regimen as to diet, clothing, air and exercise unsuited to its wants and powers, and frequently injurious to its health.

Dr. Fraser says, in respect to a district of Glasgow, under his inspection :—

"Within no very limited area, none of the children that I saw were well, and I found that more than one-half of the whole, born alive, had died very young. One woman had five living children, but had lost six. In another family three survived and seven had died."

"It is no uncommon thing to find in families having originally seven, nine, eleven and even thirteen children, one or two only reaching adult-life. Fearful as this is it is to be found in nearly every considerable city in the kingdom." *

The records of sickness and mortality confirm these deductions, which are drawn from seeing the condition and habits of the poor. Mr. Chadwick, in his report on the sanitary condition of the laboring classes, page 161, says, that he found in fourteen cities and districts that the average age, at death, of 1,232 members of the most comfortable classes including the children and infants was 44 years. Of 5,035 persons in families less comfortably circumstanced, it was 27.47 years, and 20,385 persons in families of the poor had enjoyed an average life of only 19.58 years. The average longevity in the most favored class exceeded that in the poorest by 125 per cent.

The difference was most in the deaths of the children. Compared with the number living under one year, the deaths were 20 per cent. in the best, 44.4 per cent in the middle class, and 50 per cent. in the poorest.

The experience of Paris gives a similar result. Villermie says, that in three arrondissements, where only 7 to 11 per cent. were exempt from tax on account of poverty, the deaths of infants, at their homes, were only one in sixty-four of the living, while in other districts, in which 31 to 33 per cent. could pay no tax, the deaths, were one in forty-five.

The deaths of infants at home and in hospitals were one in forty-three living in the richer, and one in twenty-six in the poorer districts.

There are no records in this country that show the mortality of the comfortable and the poorer classes separately. But in Massachusetts and in Boston, the births and deaths in the American and foreign families are separately recorded.

The record of the American families include all the native poor as well as the prosperous. But a much larger proportion of the foreigners are poor.

In Boston, during ten years, 1862 to 1871, there were born 20,867 children of American and 42,582 of foreign fathers. In the same time, the deaths were 3,438 under one year, and 5,428 under five years, of the first class, and 7,719 under one year, and 13,943 under five years, of the second class.*

Of those that were born in American families, 16.47 per cent. died under one, and 26 per cent. under five years. Of those born in foreign families, 18.13 per cent. died under one, and 32.79 per cent. under five years.*

The mortality of the foreigners' children was 10 per cent. greater under one, and 26 per cent. greater under five than that of children of natives.*

In Massachusetts, in the four years, 1867 to 1870, of the children born of both foreign parents, the ratio of deaths under one year exceeded that of the children of Americans by 10 per cent., and under five years by 28 per cent.*

In this connection the comparative ratio of infants and children to those of all ages buried in the Mount Auburn and the Catholic cemeteries in the vicinity of Boston agree with these deductions. During the periods examined there were of all ages, 19,735 buried in the Catholic cemeteries, of whom 5,688 or 28.7 per cent. were under one, and 11,486 or 58.2 per cent. under five. At Mount Auburn 16,949 were buried, of whom 1,973 or 11.6 per cent. were under one, and 4,771 or 28.1 per cent under five.†

The Catholic families are immigrants, and therefore have a very small proportion beyond middle age. But they have a much larger proportion of young children than the families whose members are buried at Mount Auburn, but the proportion of this excess of their living is much less than is shown of their dead children.

Records of the mortality of Concord, Mass., for sixty-five years, and of Dorchester, for seventeen years, show the occupation and social positions, as well as the age of the deceased.

* Annual Mortality Reports.

† Condensed and calculated from the records of the cemeteries.

The proportion of deaths under two years in the families of the farmers that owned their farms, was 11.94 per cent. of those of all ages, and in the laborers' families the proportion was about double, or 23.5 per cent. In order that the farmer should own his farm, it is necessary that his wife, who is his partner and coöperator, should be wise, discreet and thrifty. This wisdom and discretion, which she brings to the management of the general affairs, is shown in the care of her children, and this is the result.

EDUCATION AND IGNORANCE.

The infant's life is in the care of the mother, and its safety depends upon the intelligence and discretion that she can give to this responsibility. There is no record that discriminates between the intelligent and the ignorant of the mothers, showing the number of each class. Nor is there any record of the deaths of the infants of these educated and uneducated parents. But there is an approximation to these facts on a large scale in the registration reports of England.

In England every person when married is recorded, and required to sign the register; and if unable to write, the groom and bride must make the mark.

The reports show the numbers and proportions of both grooms and brides in each district, who wrote their names or made their marks.

The same records show the births and the deaths at each age. For the purpose of showing the connection between the education of the parents and the life of their children, the records of twenty-five years, including 3,362,742 marriages, have been analyzed, and divided into several classes, according to the proportions of the brides who wrote their names in the register.

In the most intelligent class, there were 648,260 marriages, and 20 to 30 per cent. of the women made their mark. In the least intelligent class, there were 661,929 marriages, and 60 to 70 per cent. of the brides made their mark. In the first class there were 2,231,959 children born, and 327,040, or 14.65 per cent., died under one year old. In the last class 1,776,547 children were born, and 439,359, or 24.87 per cent., died before they passed their first year. As often as 1,000

died in their first year, in the more intelligent class, 1,698 died in the least intelligent class among the same number born in each.

These classes are both large ; each includes city and country, commercial, mining, manufacturing and agricultural districts. The only difference apparent is the diverse proportion of the mothers who could write their names.

It is not to be supposed here, that the simple fact of inability to write caused the death of infants. But this inability to write is a representative fact. It represents a want of education and intelligence, a lower degree of discipline and thrift ; with these mental and moral conditions are associated more poverty, and even destitution, the more frequent want of means of support and the comforts of infant life, a more careless and indiscreet management, more intemperance, and neglect of children. In the best class 20 to 30 per cent. could not write, and in the worst class 30 to 40 per cent. had this accomplishment, but if these could be excluded, and none but the educated be in the first, and none but the ignorant in the last class, the difference in the chances of infant-life would be found to be much greater.

OVERLAID—SUFFOCATION.

A cause of death of infants is found in the British and Irish reports, termed *overlaid*, or smothered by the parent or nurse in bed. The reports of England show that in the eight years, 1863 to 1870, 1,125 were destroyed in this manner ; this is 140 a year. But perhaps these are not all. In these eight years, there were 7,580 deaths from suffocation ; 5,588 of these were children under one year, 1,125 were overlaid, and 3,606 were said to be "*suffocated by bedclothes.*"

How many of the last were overlaid is not known. But from evidence given in a discussion of this matter, at a meeting of the Social Science Association, 1864, it may be feared, that many more infants were overlaid and put to death by their parents than these figures indicate. Dr. Lankester, the learned and scientific coroner of London, said, "I find that in one year I held inquests on ninety children who have been suffocated in bed." Mr. Raper said, "It appears that seventy-two cases of deaths of infants that had occurred from suffoca-

tion between Saturday and Monday, were brought before the coroners' courts of Liverpool."

Dr. French: "The parents having been paid their wages Saturday, get drunk and neglect their children." Dr. Raper: "The great bulk of these, nearly the whole, occur through the drunkenness of their parents. The beer-bill created 8,000 beer-shops in Lancashire." "The removal of that law would remove the temptation to that vice, that produces a great deal of our infant mortality." Dr. Lankester: "A large number of these children are found dead on Sunday morning, and, I fear, many of them are caused by the Saturday-night orgies. Drunkenness is the frequent and fruitful cause of infant mortality." *

The term *overlaid* does not appear in the mortality reports of other countries. But suffocation is given as the cause of ninety-two deaths of all ages, of whom sixty-three were under five, in Massachusetts, within the five years ending with 1870. The last census of the United States reports 1,255 deaths from this cause, in the year 1870-71, of which 931 were of infants under one, and 1,023 were under two. In the "Southern Medical Reports" printed in New Orleans, about twenty-five years ago, Thomas Affleck, Esq., of Washington, Mississippi, in an article on the hygiene of cotton-plantations states, that "the mortality of negro children is two to one when compared with the whites;" "not a few are overlaid by the wearied mother, who sleeps so dead a sleep as not to be aware of the injury to her infant." This finds some corroboration from the mortality report of the last census. In the year 1869-70, in eight Southern States, with a population of 7,222,409, of whom 3,271,321, or 45.3 per cent. of all, were colored, there were 552 deaths from suffocation; 479, or 86 per cent. of these, were of children under one year. In ten Northern States, with 17,622,493 inhabitants, of whom 306,254, or 1.7 per cent., were colored, there were 406 destroyed by suffocation; 228, or 56 per cent., were under one. Most of the others were adults suffocated in mines by charcoal fumes, etc.

In the States where the colored population forms a large proportion of the whole, the deaths from suffocation were

* Transactions, 1864, p. 651.

one in 13,084 living, and the babes were 86 per cent. of the whole. In the other States, with a very small proportion of colored people, the deaths from this cause were one in 48,405, and the infants were only 56 per cent. of the victims.

ILLEGITIMACY.

Quetelet, speaking of illegitimate children in his work, *Sur l'Homme*, p. 231, says, "The deadly heritage of vice attends the infant before birth, and pursues him for a long time afterwards."

The depressing circumstances, conditions and influences that sometimes attend and impair the life of children born in wedlock, are more intensified and destructive, and hover more frequently about those who have no legitimate fathers.

The mother, oppressed with shame and sorrow, endeavors to conceal her state, by all the means of dress and compression. Practically denying her condition she can ask no favor of family or society, but assumes and bears the burdens and labors that are assigned to the healthy and unencumbered. The child is deprived of the requisite opportunity of development and growth. Means are often used for its premature removal, and result in its injury, and when at length it is born, its constitution is generally lower than that which belongs to the children of honest parentage.

As soon as the unwelcome child is born, its exceedingly feeble life is surrounded with foes on every side, and finds few friends to protect and sustain it. An object of fear and anxiety to the mother, who is allowed but little or no opportunity to attend to its wants and caress it, an object of aversion and even of disgust to the family and associates, there are few or none to offer their tender and affectionate attentions to this frail waif of humanity, and make its difficult path to strength as easy and sure as to other children. Family, friends and society, or the inexorable force of circumstances, deny the claim of the child upon its mother for parental care. But they demand of her that she shall bear her part of the burden of the world and work with her hands, as if she had no maternal love and no object to expend it upon.

Most frequently society recognizes in this forlorn, deserted woman, no other attribute of motherhood than the fountain

of nutriment which nature has provided in her person for her own offspring. But even this she feels compelled to sell, with all her power of motherly sympathy and attention, in order to obtain bread for herself and her babe. Thus the well-born child of affection and honor drinks the milk and enjoys the exclusive watchfulness that naturally belongs to another, while the base-born child of infamy and sorrow is deprived of its only heritage of good; it is made an outcast, and sent to live with hirelings. Although these strangers have no motive but gain, they are poorly paid for their responsibility. They have neither the intelligence nor the heart, still less the time to give that which the infant most needs,—a mother's judicious and affectionate care. They may feed it with the natural food, but generally with the milk of animals and diet less digestible and less fitted to sustain its life and health. The child's feeble constitution has a hard struggle with these unfavorable conditions and circumstances, and often sinks beneath their weight.

In Prussia, during fourteen years, while 17 per cent. of the legitimate infants died in their first year, 25 per cent. of the illegitimate died at the same age. In Berlin, 19.8 per cent. of the first class, and 36.2 per cent. of the other died in infancy. In Stettin, in the five years, 1854 to 1858, these proportions were 22.3 and 45.1 per cent. respectively.

In Bavaria, through five years there were born in wedlock 633,119, and out of wedlock 190,349 children. The deaths in the first year were: legitimates 207,750, or 32.8 per cent.; illegitimates, 72,663, or 38.29 per cent.*

In Austria in 1861, 1862 and 1865, and in Hungary in 1865, the births were:†—

Legitimate,	2,705,536
Illegitimate,	371,275

Deaths under one:—

Legitimate,	645,663, or 23.86 per cent.
Illegitimate,	129,419, or 34.85 per cent.

Quetelet, quoting from Sussmilche, says "that for every ten of the legitimate that die in each of these several periods,

* Statistische König Bayern, 1861.

† Oesteriche Jaarbuch, condensed.

there are deaths of the illegitimate in the first month, twenty to forty; in the second and third months, twenty; in the fourth to sixth months, seventeen; in the seventh to twelfth months, fifteen, out of the same numbers born in each class.”*

The reports of France and other nations tell the same story, showing the universal law, that infants born out of wedlock suffer the necessary consequences of neglect, the frequent privation of maternal care and appropriate food. They have therefore a lower vitality, and a larger proportion of them die in infancy and childhood, than among those that are allowed to enjoy the tender, faithful care and appropriate food that nature intends for her little children.

FOUNDLINGS—ABANDONED CHILDREN.

Beneath the low depths of wickedness and suffering just described, there is a still lower depth connected with the children,—those that are abandoned by their mothers and left in the street to take their chance of death, or of being rescued by the pity of strangers, or sent to the foundling-hospitals with a somewhat better chance of life. This is usually the last act in the long process of concealment practised by the mother whose condition and suffering have been known only to herself and one or more confidants.

Some of these infants have been the subjects of attempts to procure abortion. From all these causes these children come to the world, with the lowest vital force, the smallest hope of continued life. Then they are rarely fed,—almost never properly,—as they are hurried away before the natural nourishment is provided. To prevent the crying that might lead to discovery at home or on the way from the place of birth to the stranger’s doorsteps or to the foundling-hospital, the child is often stupefied with opium. On the way to either, or while waiting in the street, if left there, the little spark of life suffers another cause of extinguishment, from exposure to the air to which it is unused, and to cold which it cannot resist.

However discreet and kind the people may be into whose hands the child may fall when left at their door, they are not

* Sur l’Homme, 231.

prepared for such a responsibility ; they cannot meet its necessities, they are not nurses, they have not the natural food. Through the transition from its first resting-place, through the police, the station-house, to the asylum, if such there be, to the almshouse, or possibly to some charitable heart, that is willing to receive, and even adopt it, the infant finds no strengthening, but is subject to continual exhaustion, and when it arrives at its destination, its life is very low, and gives but little promise of continuance.

With such children nothing but the best appliances will avail. More than others they need the human milk, yet few can be indulged with it, and even they, with rare exceptions, can have only a part, a small part, of their nourishment from this source. Their main dependence must be on the bottle-nursing. But the best care, protection, warmth and food are necessary, and even these sadly fail in a large proportion of these waifs. In the best institutions, even in the Massachusetts Infant Asylum, managed with the best charity and wisdom of the State, provided with the tenderest and most discreet attendance, with airy, properly warmed and ventilated rooms, with clothing most suitable and food most digestible and nutritious that can be obtained, including wet-nursing as part of the nutriment, with all these means of sustaining life, 48 per cent. have died in its four years' operation. The New York City Foundling-Hospital was opened in November 1869 ; in the first year 1,480 infants were admitted, and 826, or 55 per cent., died within that period.*

In almshouses, that have no especial provision for the care of these feeble children, where the extreme tenuity of their thread of life is not understood, and especially where economy is the ruling principle, the rate of infant mortality is much greater.

Foundling-hospitals are plentiful in Europe. They have received multitudes of abandoned children. And the general history of their operations shows how small is the vital force of those committed to their care, and how few of them can be saved.

In Rome, the mortality was 57 per cent.

* Rep. Board of Health, 1870, p. 279.

Sir James Simpson, in his lecture on health, before the Social Science Association, in 1867, said, "I mention the frightful mortality in foundling-hospitals, where all the laws of health are set at defiance. In the old Dublin Foundling-Hospital, of the last century, only some 135 lived out of 12,000 infants admitted."*

This, however, has been improved, for out of 52,000 admitted in thirty years, 1795 to 1826, only 41,000 died.†

EFFECT OF COLD.

Children need fresh air for respiration, but little infants suffer from cold. "It is the custom in France to carry infants, within a few days of their birth, to the office of the mayor of the town, in order that the birth may be registered and the child become possessed of its civil rights." This is done through all seasons. The proportion of death within a limited period after birth was much greater in winter than in summer. "It was greater in the northern than in the southern parts of France." "It was greater in the sparse districts, where the children were carried long distances, than in the densely peopled places."‡

In Russia, the deaths of children varied from 31.6 in the warmest provinces to 69.1 per cent. in the coldest. These differences follow the isothermal lines rather than latitudes. Wherever, from geographical structure, mountains and valleys, exposure to or protection from winds, the climate was colder or warmer, the same variation of infants' life and death was manifested; the cold air destroyed, the warm air saved many.

Here, however, we are met with the fact, that in Norway was the lowest rate of death within one year after birth. This is to be explained by the domestic character of the Norwegian mothers. They are mostly wives of farmers, discreet and faithful to their responsibilities in the care of their households, and especially of their children.

The constitution of children is strengthened by exercise in the open air, under proper conditions of protection, yet the

* Trans. 1867, p. 122.

† Porter's *Progress of the Nation*, III., 288.

‡ Edwards' *Influence of Physical Agents on Life*, 216.

plan of hardening, which some attempt, is destructive. It destroys the weak and weakens the strong.

COUNTRY AND CITY.

It seems to be a universal law that condensation of population lessens the chances of life. The ratio of mortality is greater in city than in country, and this increases as the people live nearer together in the city.

The supplement to the English Registrar-General's twenty-fifth report, pages xxxviii to lviii, gives a table showing the number of deaths in 10,000 living, and average number of people to an acre of land, in each of the six hundred and twenty-three districts of England and Wales.

In the districts which had 100 to 250 persons to the acre, the annual deaths were 262 in 10,000 living.

In those which had one to two acres for each inhabitant, the deaths were 214 in 10,000.

In the thinly settled districts, with twelve or more acres for each, the deaths were only 168 in 10,000.

In the cities the mortality increased with the crowding of the living, as shown by the reports of deaths in the four places below.

TOWN.	Living to Square Mile.	Annual deaths in 10,000 living.
London,	50,000	251
Leeds,	87,256	272
Manchester,	100,000	337
Liverpool,	138,000	348

The excess of mortality falls in greater proportion on childhood than on maturity.

The deaths in the healthiest districts were 10,604 in 100,000 children under one year.

In Westmoreland and North Wales they were 11,884.

In fourteen city districts, 25,858.

In Liverpool, 28,005.

The annual deaths under five in the period, 1849 to 1853, were, in thirty cities, 338,990, and in healthy country districts 135,478, in the same population in each. As often as 100 died in the healthy country, 250 died in the city, among the same number living.*

The life-table, founded upon the most rigid observations, makes the proportions of deaths of children to be 5.29 per cent. for the country and 13.34 in the city, or as 100 to 252.

The reports of births and deaths of Scotland make three divisions of the people.

1. Those living on the islands.
2. Those living in the country of the mainland.
3. Those living in the great cities.

During the fourteen years reported, the proportions of deaths of children, for every hundred births in each class, were—

	Under one.	Under five.
Islands,	8.05	15.58
Mainland country,	9.80	18.26
Cities,	14.91	30.90

As often as 1,000 died on the islands, 1,217 died on the mainland country, and 1,852 in the cities, under one; and 1,172 in the rural, and 1,983 in city districts, under five.

There are similar differences in France. The deaths in 1861 to 1865 were less than twelve per cent. in two departments; less than fifteen per cent. in six; less than seventeen per cent. in nine departments, and 39.07 per cent. in Paris, in the same number living under one year.†

A chart recently published by Bertillon, shows the different rates of mortality of children under one and under five in each department, by the varied shading from perfect white, for the healthiest, to perfect black, for the most unhealthy.

* Reg. Gen. Sup., XXV. Rep., p. xxvii.

† Mouvement de la Population, 1861-1865, p. lxvii.

It is a little noticeable that the department of the Seine, in which is Paris, is not the blackest, but it is somewhat lighter, and its rate of infant mortality is 268.6 in 1,000; while seven of the neighboring departments are black, with rates of 277 to 359 in 1,000. The explanation is easy. It is the custom of the officials of the maternity and foundling hospitals of Paris, to send a large part of the infants to the country to be cared for, and their frequent deaths swell the rates of infant mortality in these districts, while that of the city is thereby diminished. Nevertheless, even these have a better chance of life in the country than they would have in Paris.

In 1863 the public administration of charities in Paris had charge of 22,829 infants; 17,759 of these were sent into the country, and there 1,359, or 7.65 per cent., died; 4,397 were retained in the city, and there 469, or 10.6 per cent., died.

Dr. Berg, the chief of the Royal Statistical Bureau of Sweden, says: "The difference between the towns, especially the large towns, and the rural districts has an important effect on the mortality of children of that country."

Dr. Herz makes the same report of Austria. And the records of mortality of other European nations give similar accounts.*

"In the least unhealthy rural districts of England, the death-rates of children, in their first year, are not more than one in twelve or fourteen. In the least unhealthy urban districts, there dies one in eight or nine, in the first year. In Manchester, one in five dies, under one, and one-half of all that are born there are dead, soon after their fifth year. But in Berlin, Prussia, one out of every three dies within the first year, and half of all that are born there, are dead within two and a half years after their birth. In 1871, 31,262 children were born, and 10,072, or 32.2 per cent., died within that year." †

* Journal Statist. Society, London, March, 1866.

† Edwin Chadwick, in Journal of Society of Arts, London, Dec. 20, 1872, p. 87.

In Massachusetts these facts were as in the following table, during the ten years, 1861-1870:—

	Births.	Deaths— under one.	Ratio of deaths under one, to births.
Boston,	60,354	11,537	19.11 per cent.
Thirteen other cities,	80,088	13,863	17.30 “
Rest of State,	198,030	24,547	12.39 “

The rate of infant mortality, in comparison with the births, in the thirteen smaller cities, exceeded that of the open country by 39.60 per cent., and that in Boston had an excess of 54.23 per cent. Among the same number of children, born in each of these classes of places, as often as 1,000 died in the country, 1,396 died in the smaller cities, and 1,542 in Boston, under one year.

There are differences in the same city. In four of the districts of London, the deaths under five were from 50 to 59; and in four other districts, these rates were from 101 to 108 in 1,000 living, of the same age. Between these extremes, there were all intermediate grades of mortality in other districts. This is due in part to the different densities of the population, and in greater degree, to the difference in their domestic condition.

Similar differences were found in Boston in 1870, the year of the census. The State Board of Health divided the city into twenty-four districts, according to their sanitary condition. Some of these were low and wet, others were hilly and dry. Some were laid out with wide streets, open grounds, broad sidewalks, and were inhabited by the wealthy and comfortable classes. Others were filled with narrow streets, lanes and courts, and in these were crowded the dwellings and families of the poor. In the most favored districts, the deaths of infants under one, were 86, 100, 167 and 171 in 1,000 living at that age. In the unhealthy districts the mortality was 359, 379, 409 and 486 in the same number of living infants.*

* Report State Board of Health of Massachusetts, 1871, p. 350.

In the most unhealthy districts are the abodes of the poor. Their hard and exhausting labors, their domestic and personal privations, make all external aids of health more necessary to them than to others. But their necessities compel them to live in small tenements, with one, two or three rooms for a family. Dirt, filth, offal constantly gather in their narrow and undrained streets, lanes, alleys and courts, and in their yards, if they be so fortunate as to have them. The public authorities and their agents the scavengers and sweepers, feel little motive to cleanse the places that so soon become foul again, and often, with all their faithfulness and energy, find it impossible to keep the pavement in satisfactory condition. The air without is befouled with the emanations from the ground. And the air within the dwellings is corrupted with the exhalations from the persons of the family and their necessary processes of labor.

There is but little chance for the children or adults to de-carbonize their blood with fresh air within, and not much inducement to look for it abroad. The broad streets, where pure breezes blow, the wide sidewalks, where children can play, the parks, commons, squares, that are kept open for the health of the city, are not in their neighborhood, nor within their physical or moral reach, nor are they for such as these who need them most.

Here the family of all ages, and the infants more than the others, have a hard struggle for life, but find no fulness thereof; for "impure air resulting from overcrowding, imperfect ventilation and decaying refuse of every kind, is by far the most fatal and widespread of the morbid agents to which the young are exposed; and this is the most potent among the physical causes of disease." "Moreover, the enfeebled state of the system, induced by the deteriorating effects of vitiated air, is most unfavorable in rendering children unable to withstand the force of epidemic and contagious diseases, to which they are so liable,"* and which have their favorite haunts in the crowded districts of cities and among the poor. Hence their high rate of infant mortality.

* Dr. Fraser, in *Social Science Trans.* 1860, p. 650.

EFFECT OF CIVILIZATION.

One of the most happy consequences or evidences of the advance of civilization is the improvement in human health. The rate of mortality is diminished in every successive age of the civilized world, and especially in infancy and childhood. More infants now survive to the full development of maturity than in the previous centuries. The period of vigor is protracted, old age is deferred, death comes later and the average longevity is increased.

The records of Geneva in Switzerland are the most full and satisfactory for the earlier periods of the world.

The deaths in 10,000 born were,—*

PERIOD.	Under 1.	Under 5.
Sixteenth century,	2,592	4,435
Seventeenth century,	2,372	4,100
Eighteenth century,	2,012	3,316
1814 to 1833,	1,385	2,440

In the first period, one-half died before they completed their ninth year. In the last, one-half survived their forty-fifth year.

Dr. Farr, in Macculloch's Statistical Account of the British Empire, II., 543, says, that the proportion of children raised, has doubled within a hundred years. In London, the proportion of deaths under five were,—

1730 to 1749,	74.5 per cent.
1770 to 1789,	51.5 “
1851 to 1870,	29.8 “

“So great was the rate of infant mortality in London, that an Act of Parliament was passed in 1767, ordering that all parish infants should be nursed six years in the country.

* Mallet in Ann. Hyg., XVII., p. 98.

Before this, almost all parish children died in their first six years." *

According to the Life-Tables, 32 per cent. of all that were born in the ten years, 1728 to 1737, died under one. One hundred years later, only 12.5 per cent. died at this tender age. †

The diseases—especially the epidemic and contagious diseases—were formerly more prevalent and virulent among children in the earlier ages than at the present time.

In London, from 1675 to 1732, convulsions, mainly a disease of childhood, caused 23.91 per cent. of all the deaths. ‡ From 1862 to 1870, only 3.3 per cent. of the whole died from this disease, and in Massachusetts, only 1.8 per cent. since 1843.

In the ruder and less intelligent society that existed one and two hundred years ago, the morbid influences that wasted the lives of children were more prevalent and effective than in the later times. Civilization includes among its manifold blessings, the increase of human life ; all ages enjoy its benefits, but none so much as infancy and childhood.

The growth of intelligence, the increase of wealth, with ameliorations in the personal and domestic condition of the people, the improvements in the comforts of home, in dwellings, in clothing and food, the purification of morals, the softening of manners, the higher conscientiousness and broader and warmer charity,—all are blessings in themselves, and still more in their effects on the human organization. Each one and all these elements of civilization, in as far as it pervades and influences society, families and persons, contributes its due proportion to the development of the constitution, and enables it to ward off the attacks of disease, or to resist its destructive power when it comes.

On the contrary, wherever any of these elements are wanting, wherever ignorance, poverty, privation, negligence or exposure exists, its effect, according to its degree, is felt by the exceedingly sensitive constitution of early life.

Civilization, which in itself is an unqualified good to both manhood and childhood, is yet not unaccompanied with evil.

* Price Annuities, II., 32.

† Price Annuities, II., 45, 297.

‡ Corbyn Morris. Past and Present Growth of London.

More plentiful means of life bring temptations and opportunities for indulgence in food and clothing that may be injurious. Fashion, which is not founded on wisdom as its permanent rule, sets at naught sanitary principles when they stand in its way. It often clothes children in a manner rather to please the external eye, than to protect them from the elements and give the tender body that genial warmth that it needs. Sometimes the child is buried in clothes and heated beyond measure. Sometimes one part is overloaded, while another is naked. The head is sometimes oppressively wrapped in cape or hood, while the arms or legs or parts of them are exposed to the full power of the cool atmosphere.

THE CHILD NEEDS THE MOTHER'S CARE.

A child is the most precious gift offered to mankind, and brings with it the most sacred and exacting responsibility. To develop its constitution and protect it from morbid influences, require special knowledge of its nature, wants and dangers, and unremitting care and faithfulness in its management.

Nothing is accomplished without the best intelligence and preparation for the purpose. Youth is the time to prepare for the burden of life. Men, regarding this law, seek their way, through pupilage, study, observation, apprenticeship and labor to their field of service in agriculture, mechanics, trade or other pursuits; and when sufficiently trained and educated, they are allowed and encouraged by the world, to become responsible managers and operators in their respective occupations. Then they succeed, in proportion to the intelligence and devotion they bring to their work, and the skill which they apply to the business they undertake.

From the beginning, the law was established that people should marry, and that children should follow marriage. Whatever may be said of the sphere of woman, this precious charge of new-born humanity has ever been entrusted to her. She has ever claimed or accepted this trust. Her physical and moral organization, her possession of the natural nutriment, her tender affection, her inimitable tact and facility of adaptation, give her alone the power to fulfil this responsibility; and more than all others is the mother fitted for this duty.

INTELLIGENT MOTHERS.

Yet even the mother requires something more than her natural capacities, her loving instincts and her ready sympathies. It is necessary that she be acquainted with the infant nature—its wants and liabilities. But ordinarily she comes to her first motherhood, without preparation, without knowledge of what needs to be done and how she shall do it. With all her good-will and conscientiousness, numerous mistakes are made, the child suffers from errors in diet, clothing, from exposure, from too much or too little nursing. Disease may attack the infant, whose feeble constitution is unable to resist it, and sinks beneath its destructive force.

The records of infant mortality offer a melancholy illustration of the necessity of the mother's previous preparation for the care of her children. The first-born die in infancy in much larger proportion than their successors in the family. The mother learns at the cost of the first child, and is better prepared for the care of the second, and still better for the third and fourth, whose chances for development into the fulness of strength and life, are greater than those of the oldest brothers or sisters.

CHILDREN'S NURSES.

When the strength or time of the natural family is insufficient for all its diverse operations, and strangers are called to aid in various ways, they are selected on very different principles. Before the dress-maker is employed, assurance must be given that she has so learned her art, that by no error in judgment or of hand, the garments and outward adornments will fail to fit the frame or meet the unrelenting law of taste.

But no such caution is manifested in the employment of a nurse for the little children. The same measure of skill in her occupation is not required. She is not expected to understand the infant's constitution, or to be familiar with its wants, weaknesses and dangers. Nor is the same assurance of discretion and faithfulness demanded of her as of the maker and fitter of garments, before she is allowed to begin her work.

It is not surprising, then, that she sometimes errs in judg-

ment, in respect to the food of the child at home or elsewhere, or to the clothing, the protection from or exposure to the cold or the heat abroad, or that she be occasionally careless or even wilfully negligent. As a necessary consequence, the child's health suffers in proportion to the ignorance and unfaithfulness of its guardian, as the dresses would if the mantua-makers were selected with no more evidence of fitness, or as the father's business would, if his agents had no better preparation for their responsibility than the nurse.

With all the perils that surround the frail organization of the infant, nothing short of the mother's undivided interest and watchfulness can give it the best protection from danger and the best assurance of health and life. This is her highest responsibility; and its wise and faithful fulfilment insures the richest and most enduring reward.

CIVILIZATION HAS MORE TO DO FOR HUMAN LIFE.

Civilization has done and is still doing much for human life, but it has not yet wrought its perfect work. There yet remain in the nation, in families and in persons, many of the causes of low vitality, and especially in infancy. There are yet poverty and ignorance, with their painful inability to develop the human constitution to its fullest power. There are yet crowded, uncleaned and unventilated districts of cities, with their withering influences on childhood. There are the ignorant, the selfish, the sensual and the self-indulgent parents, to whom the care of infancy is a burden. But these, and many other obstacles to the progress of humanity are gradually diminishing, and with this improvement, infancy becomes stronger and more able to resist the attacks of disease, and fewer children sink by the way from birth to the fulness of maturity.

